



March 2009

City of Rossland
Community Wildfire Protection Plan
Final Report

Appendix 4A - General Fuel Treatment Recommendations

Fuel Break Type: Fuel treatment recommendations provide for both shaded and open fuel breaks by varying whole tree spacing criteria.

Shaded fuel break - Fuel treatment recommendations for smaller, non-continuous blocks of fuels located within the City interface. These areas are subject to accidental or spot fire ignitions and fuel treatments focus on preventing ignitions from developing into high intensity crown or surface fire. This treatment will focus on surface/ladder fuel removal with less aggressive whole conifer thinning (standard specifies 3 crown widths between tree crowns). This prescription can also be applied wherever site aesthetic issues exist.

Open fuel break - Fuel treatment recommendations for continuous fuels located on or adjacent the City interface. These areas are subject to crown fire impingement and fuel treatments focus on preventing crown fire spread. This treatment will focus on surface/ladder fuel removal with more aggressive whole conifer thinning (standard specifies up to 6 crown widths between tree crowns).

Fuel Treatment Standards - Tree Removal Criteria

Open Thinning Fuel Break - Conifers to be thinned to leave space between crowns of remaining trees averaging 4 - 6 crown widths in areas containing mature Douglas fir and open pine, and 3 - 4 crown widths in mixed pine/fir or denser, even-aged pine locations.

Closed Thinning Fuel Break - Conifers to be thinned to leave space between crowns of remaining trees averaging 2 - 3 crown widths in areas containing mature Douglas fir and open pine, mixed pine/fir or denser, even-aged pine locations.

-Whenever possible, Douglas-fir and live or dead deciduous trees shall be retained (safety considerations excepted) with immature Douglas fir preferentially removed to meet thinning standards.

-The majority of spruce >5 metres are to be removed as they are prone to wind throw; some individuals will be retained for biodiversity considerations and wildlife cover.

-Variation in tree spacing is encouraged to facilitate diversity and accommodate burn piles. Cluster thinning will be used to protect habitat trees, limit windthrow, and enhance diversity - 10 - 15 clusters of 8 to 15+ trees per hectare will be created. Forest openings as large as 60 metres in diameter will be created by clearing all trees and correspondingly, some thickets will remain unthinned.

-To minimize visual impacts of fuel reduction, tree stumps will be cut as close to the ground as possible.

Habitat trees (live or dead trees with cavities in stem or nests in crown) and potential habitat trees (dead standing trembling aspen, balsam poplar or coniferous trees >30 cm DBH with stem disease) left standing.

Unmerchantable stems shall be cut and piled to facilitate burning.



March 2009

**City of Rossland
Community Wildfire Protection Plan
Final Report**

Fuel Treatment Standards – Surface Fuel Removal Criteria

Accumulations of slash (fine fuels, branches / tops) can be left on site but are to be reasonably piled to facilitate follow-up burning by hand crews. These piles will be located to comply with burn pile standard specifications.

A minimum of 50 pieces of downed trees and decaying logs (coarse woody debris - CWD) per hectare (one piece for each 200 m² or a 20m radius circle) shall be retained on the forest floor for wildlife habitat. Retained CWD will meet the following specifications:

- retain stem sections >30 cm as first priority;
- retain stem sections 15 – 30 cm as required to meet 50 pieces CWD/ha specification.
- all stem sections <15 cm will be removed;
- >50% of retained stem sections will be cut to lie flush with forest floor - all branch wood will be removed.
- deciduous and Douglas fir stem sections will be prioritized (in that order) for retention;

Downed trees in excess of this number and standing dead less than 25 cm DBH may be recovered to a central location for firewood.

In areas with significantly less than 50 downed trees per hectare, dead standing trees less than 25 cm DBH may be cut and left on the forest floor (or left standing to fall eventually).

Up to 50 stems of coniferous regeneration (1 - 5 metres) and advanced regeneration (5 - 10 metres) of spruce, Douglas fir, and balsam fir is to be retained per hectare. Where these occur under or within 5 metres of mature pine overstory, the adjacent or overtopping mature pine are to be removed in order to accelerate forest succession. “Guard” trees (small snags or suppressed pine) will be left to protect regeneration where possible.

Fuel Treatment Standards - Dead Standing Tree (excluding habitat or potential habitat trees) Removal Criteria

75 - 100% of dead wood <12 cm in diameter and all tops of downed conifers will be piled and burned on site.

25 - 75% of dead wood between 12-30 cm in diameter will be piled and burned.

Dead trees >25cm DBH will be topped* at 5 or 6 metres above the ground (max. 12 trees/ha or wherever considered unsafe/hazardous to workers). *at mechanical falling sites only.



March 2009

City of Rossland Community Wildfire Protection Plan Final Report

Fuel Treatment Standards - Burn Pile Criteria

Slash is to be left on site - piled to facilitate follow-up burning by hand crews.

- Hand and machine piles will be constructed and burned in compliance with the B.C. Wildfire Act and Regulation.
- Machine built piles no larger than 5m.
- Piles located to minimize scorch and to avoid squirrel dens or other habitat areas.
- Piles located >8 metres from unit perimeters so as not to contribute to crown fire initiation in the event of wildfire occurrence.
- Piles only ignited under low fire hazard conditions.

Pile burning operations must be only be undertaken by fire trained ignition crews with full suppression capabilities and in compliance with the Wildfire Act and Regulation and the Environmental Management Act and Open Burning Smoke Control Regulation. Understory burning is to only be undertaken during periods of low fire hazard with conditions favorable to smoke dispersal (e.g. when inversions are not likely to trap smoke in low lying areas).

Fuel Treatment Standards - Variances from General Fuel Reduction Recommendations

Work specifications may vary within site boundaries to comply with any City identified priority to maintain a 'natural' site aesthetic to the greatest extent possible (while still meeting wildfire hazard reduction objectives).

Work specifications may vary within site boundaries to comply with specified environmental impact mitigations. Specifically:

1. Thinning prescriptions in wildlife corridors may require variance to:
 - tree removal criteria (unthinned leave strips maintained in specific areas or the use of cluster thinning) adjacent to areas of high human use;
 - surface fuel removal criteria (maintenance of near-ground vegetation cover and reduction of pruning standards) adjacent to areas of high human use.
2. Discovery of specific archaeological, cultural or heritage values, critical habitat or rare and endangered species of flora or fauna during ongoing fuel reduction activities may require changes to the established fuel reduction prescription.
3. Thinning operations adjacent fish-bearing streams and rivers will:
 - be scheduled for winter;
 - ensure all debris introduced into the stream/river channel is removed;
 - leave a buffer of mature trees adjacent streams and rivers - width to be determined by Ministry of Environment aquatic biologist.



March 2009

City of Rossland Community Wildfire Protection Plan Final Report

Fuel Treatment Actions

Fuel treatment actions are recommended for completion on 43 individual hazard reduction fuel units in 15 WUI Protection Units (31 of the 43 hazard reduction fuel units are located on private residential land).

Recommended fuel treatment actions will be accomplished:

- a) as small scale actions that can be implemented with landowner or City resources and personnel as available;
- b) as large scale actions requiring contracted logging equipment implemented with Crown / landowner resources and personnel as available;
- c) in consultation with Ministry of Forests and Range fuel management specialists as required to ensure a co-ordinated approach to both local and landscape scale fuel management actions.

Fuel Treatment Actions – Methods

1. **Handfall, pile & burn – HPB Standard:** Falling will be done by hand with chainsaws. Downed trees and litter will then be bucked into manageable pieces, piled and burned on site. Hand falling without salvage will be used in steeper terrain, sites with difficult access, and wet sites where access / site impact concerns have been identified. Hand thinning without salvage may also be selected to provide greater control of post-thinning appearance in areas adjacent structures or in ‘aesthetic buffer strips’ - where maintenance of a natural site aesthetic is important.
2. **Handfall salvage, pile & burn – HSPB Standard:** Standing timber with market value will be felled by hand, moved to a decking area by skidder, and then loaded onto trucks and sent to a processing facility. Non-merchantable stems, branches and litter to be bucked, piled and burned on site.
3. **Mechanical salvage, pile & burn - MSPB Standard:** Falling will be done by mechanical means such as a faller-buncher or processor. Downed wood will be salvaged wherever possible with non-merchantable stems, branches and litter to be bucked, piled and burned on site.
4. **Chip & spread – CH Standard:** A mechanical wood-chipper will be transported to sites requiring chipping of woody debris. Non-merchantable stems, branches and litter will be bucked to short lengths and run through a mechanical wood-chipper. The wood chips will then be spread onto adjacent trails and/or spread loosely about the forest floor using hand tools in order to promote decay. Wood chips will not be piled or spread to a depth greater than 10 cm.
5. **Firewood salvage, pile and burn - FSPB Standard:** Provision of firewood salvage opportunities is an effective method for reducing on-site fuels. Firewood salvage opportunities can be contracted to firewood contractors with established market. Contractors will tender bids for on-site wood for both firewood salvage work and debris piling and burning.

Resident Firewood Salvage: Where residents express specific interest in firewood salvage - quantities of firewood can be left on-site for resident use (with a time limit for retrieval established). Following time limit expiry, contracted crews will complete pile and burn treatment to established standards.



March 2009

**City of Rossland
Community Wildfire Protection Plan
Final Report**

Fuel Treatment Actions – Environmental Guidelines

-Any woody debris introduced into a water body or onto an iced surface during thinning operations will be removed.

-Skid trail alignments will follow moderately sloped terrain and natural benches – drainages, steep slopes (>40 degrees) and sensitive areas will be avoided. Mechanical thinning will be scheduled for winter to minimize soil compaction with operations suspended during mild weather. Rehabilitation of terrain (where fuel reduction activities expose or rut mineral soil will be accomplished by contouring, scarifying and re-seeding in the spring).

-Wetland buffer zones established prior to fuel reduction activities will be respected and machinery access will avoid all permanent or intermittent streams and wetland areas. Wetland being defined as a ‘pond, swamp, marsh, or other similar area that supports natural vegetation distinct from the adjacent upland areas including all lands where herbaceous plants have adapted to wetted soils’.

-Non-merchantable stems and debris will be piled on site to be burned. Sites will then be rehabilitated using appropriate native species.

Fuel Treatment Actions – Operational Guidelines

Dangerous Goods

All precautions will be taken to ensure that toxic materials are not introduced into the environment. On-site fuel storage and vehicle maintenance will not be permitted. Operators will be required to replace mineral hydraulic fluids with vegetable-based hydraulic fluids. A spill kit will be present at all work sites. All spills will be dealt with immediately according to City Spill Response Guidelines.

Proposed Work Schedule

The work for this proposed project is to be completed during the seasonal period of September to May. Work will be scheduled for winter months on wetter sites. Sites where riparian issues are absent can be worked at any time within the seasonal period of September to May.

Long Term Maintenance

Over time, natural forest succession will lead to a rebuilding of forest fuels at the treatment sites - effective reduction of ignition potential requires long-term maintenance. Sites will be monitored on a planned rotation and maintenance cutting or brushing work will be performed to reduce ground and ladder fuel accumulations and maintain effective crown separation. After large blowdown events, accumulations of surface fuels will be cleared. Slash will be piled and burned on site.



March 2009

**City of Rossland
Community Wildfire Protection Plan
Final Report**